

REMARKS

Reconsideration of the application in light of the following remarks is respectfully requested.

Status of the Claim

Claim 1 is pending in this application and presented as a courtesy to the Examiner. No new matter has been added.

Rejections under 35 U.S.C. § 103

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,685,949 to Yashima. The Examiner admits that Yashima fails to teach a silicon electrode plate which contains the specific atomic ratio of 3 to 11 ppba of boron, and further contains a total of 0.5 to 6 ppba of phosphorus. However, the Examiner contends that it would be prima facie obvious art to optimize the concentration of boron and phosphorus during routine experimentation to enhance plasma characteristics such as electrical conductivity, heat resistance, and corrosion resistance. Applicants disagree and traverse.

Claim 1 of the present application recites an electrode plate with superior durability, doped with 3 to 11 ppba of boron, and further contains a total of 0.5 to 6 ppba of phosphorus and/or arsenic. The total concentration of dopant is 3.5 to 17 ppba. The combination of these dopants produces an electrode plate having improved durability, resulting in reduced abrasion from etching gas ejecting through holes, and a decrease in in-plane abrasion irregularities (see application ¶¶ [0011], [0016]).

In contrast, Yashima discloses a silicon (Si) electrode doped with “ 10^{15} atoms/cm³ or more, and more preferably, between about 10^{15} atoms/cm³ and 10^{19} atoms/cm³” (Yashima, col. 8, lines 20-21). The molecular weight of Si contains 6×10^{23} atoms and weighs 28 grams. The density of Si is 2.3 gr/cm³, so there are 12.1 cm³ of Si per gram of molecular weight. Thus, one cm³ of Si contains 5×10^{22} atoms, from which 1 ppba = 5×10^{13} atoms/cm³. Therefore, the concentrations of Yashima correspond to 20 ppba to 200,000 ppba of dopant. This is non-overlapping and higher than the range of concentration recited in claim 1 of the present application.

Applicants disagree that the disclosure of Yashima plus routine experimentation would produce the recited claim 1 of the present application. Although Yashima recognizes that it is desirable to provide corrosion resistance and thereby reduce the quantity of impure particles deposited on a semiconductor wafer (Yashima, col. 8, lines 29-39), Yashima does not recognize that varying the doping level is a results-effective variable to improve corrosion resistance. Rather, Yashima discloses that corrosion resistance is improved only by performing a cleaning step that etches an oxide or nitride film on the surface of the electrode (col. 11, lines 55-63). Yashima discloses that the dopant level of 10^{15} atoms/cm³ (20 ppba) is a minimum to provide sufficient electrical conductivity, not corrosion resistance (col. 3, lines 3-6). Therefore, Yashima teaches to one of ordinary skill that the improved corrosion resistance of the present invention is an unexpected result of providing a lower concentration of dopant, since Yashima teaches the opposite.

Applicant submits that Yashima neither discloses nor suggests the features recited in claim 1 of the present application. Nor would the disclosure of Yashima plus routine experimentation produce the recited claim 1 of the present application. Applicant requests reconsideration and withdrawal of the rejection of claim 1 as obvious over Yashima.

CONCLUSION

Each and every point raised in the Office Action mailed March 5, 2009 has been addressed on the basis of the above remarks. In view of the foregoing it is believed that claim 1 is in condition for allowance and it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: June 5, 2009

Respectfully submitted,

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